PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	A systematic review of measures of self-reported adherence to unsupervised home-based rehabilitation exercise programmes, and their psychometric properties
AUTHORS	Bollen, Jessica; Dean, Sarah; Siegert, Richard; Howe, Tracey; Goodwin, Victoria

VERSION 1 - REVIEW

REVIEWER	Sionnadh McLean Sheffield Hallam University, UK
REVIEW RETURNED	29-Mar-2014

GENERAL COMMENTS	I think this is a good manuscript looking at an extremely important topic. I do have a range of relatively minor comments for you to consider. Pg 3, L55: "… this study reveals only two measures conclusively possessed any psychometric property" should that read "… this study reveals only two measures which conclusively possessed any psychometric property". Some of the introductory sections is written in the first person. Whilst I don't personally like this, it maybe the editors decision as to whether this would be accepted. P8, L58 "These same challenges also apply to the self-assessment of outcome and whether Patient Reported Outcome Measures (PROMS) are also sufficiently robust and well validated". This statement comes as a bit of a bolt from the blue and feels like a substantial and unsupported change of direction from what has been presented in prior sections of the manuscript. I think you should remove this statement and revise your final paragraph and confine conclusions regarding implications for practice and future research to adherence related issues. Alternatively, you need to provide a more expanded argument and evidence to support this statement. Appendix 2 - You refer to some of your adherence measure by its abbreviated term in a number of places in the table, e.g. GAS, SAS. It would be helpful to precede this abbreviation with the full name of the measure Appendix 3 is a table displaying the evaluated Psychometric Properties of all measures included in the systematic review, therefore should not the first column be presented by adherence measure, rather than by author?

REVIEWER	Adrian Schoo Flinders University, Australia none declared, although I am aware that one of my studies has been included in this review
REVIEW RETURNED	24-Apr-2014

GENERAL COMMENTS	I commend the authors on researching this very relevant area. The methodology seems sound, although the discussion section needs some work to do this study fully justice. Exercise adherence is a complex area that goes beyond the physical only. Exercise has an important place in rehabilitation and has been associated with many health benefits. However, too much exercise can compromise the desired health outcomes (e.g., more than 30 minutes of aerobic exercise in people with osteoarthritis of knee or hip may increase pain instead of decreasing pain) whereas not enough exercise may achieve very little. Therefore, it is relevant for the clinician to have a good understanding of patient's exercise performance away from the clinic and, ideally, to be able to predict who needs more support. Self-reported exercise performance can be a useful measure of adherence, although in conjunction with other measures. Associated exercise performance outcomes, although not accurate, can provide opportunities for the practitioner to explore underlying issues that impact on patient's program adherence. Mental health (e.g., depression) may be one of the issues patients with chronic and complex physical conditions face and that can impact on their performance (this has not been mentioned as a common issue in people with chronic and complex physical disease). When commenting on the SIRAS as a measure where people are expected to perform, it needs to be realised that observation of exercise does not have to be very obvious. In-clinic supervision can provide some insight in motivation or other factors that may be a barrier to exercise adherence (e.g., fear to do physical damage). Also, there may be a relationship between exercise performance in-clinic and mental health status, although this also needs further study. In my opinion, it will enhance this study when it includes a more robust discussion about self-reported adherence measures and their possible place in enhancing motivation or in assisting to establish an exercise routine (e.g., the latter could be seen as a confounding factor in adherence research since it may remind people to perform their home exercises), particularly in people with chronic and complex chronic disease. I have attached the document with some comments. The reference list needs some attention to make it consistent (please see highlighted areas).

- The reviewer also provided a marked copy with comments. Please contact the publisher for full details regarding this.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1 Dr McLean	
Dr McLean Pg 3, L55: "… this study reveals only two measures conclusively possessed any psychometric property" should that read "… this study reveals only two measures which conclusively possessed any psychometric property".	Thank you for noticing this inconsistency, we have removed all first person references from the This grammatical error has been rectified.
Dr McLean Some of the introductory sections is written in the first person. Whilst I don't personally like this, it maybe the editors decision as to whether this would be accepted.	Thank you for noticing this inconsistency, we have removed all first person references from the introduction
Dr McLean P8, L58 "These same challenges also apply to the self-assessment of outcome and whether Patient Reported Outcome Measures (PROMS) are also sufficiently robust and well validated". This statement comes as a bit of a bolt from the blue and feels like a substantial and unsupported change of direction from what has been presented in prior sections of the manuscript. I think you should remove this statement and revise your final paragraph and confine conclusions regarding implications for practice and future research to adherence related issues. Alternatively, you need to provide a more expanded argument and evidence to support this statement.	On reflection we agree that this paragraph is at a bit of a tangent in relation to the rest of the manuscript. We have therefore removed it and rewritten the final paragraph accordingly.
Dr McLean Appendix 2 - You refer to some of your adherence measure by its abbreviated term in a number of places in the table, e.g. GAS, SAS. It would be helpful to precede this abbreviation with the full name of the measure	The GAS and SAS are now spelt out in full followed by the acronym. The same has been done for the AESOP by Hardage et al., (2007) A prior error in Appendix 2 has also been rectified regarding table 2b, 2c& 2d headings concerning the measure name. This is also highlighted.
Dr McLean Appendix 3 is a table displaying the evaluated Psychometric Properties of all measures included in the systematic review, therefore should not the first column be presented by adherence measure, rather than by author?	This exact point was discussed by the authors during the formatting of this table. However, as not all measures had a name it was felt, for easy identification, the author name, followed by the measure name if there was more than one measure in the paper provided the greatest clarity. Identifying a measure by its name where one was evident and then by author for another measure where there was no name identified may look confusing and would be

	inconsistent, hence our decision to display the data primarily by author name.
Reviewer 2 Dr Schoo	
Dr Schoo I commend the authors on researching this very relevant area. The methodology seems sound, although the discussion section needs some work to do this study fully justice.	Thank you for your comments. We have made some changes to the discussion; please see above and later in this table.
Dr Schoo Exercise adherence is a complex area that goes beyond the physical only. Exercise has an important place in rehabilitation and has been associated with many health benefits. However, too much exercise can compromise the desired health outcomes (e.g., more than 30 minutes of aerobic exercise in people with osteoarthritis of knee or hip may increase pain instead of decreasing pain) whereas not enough exercise may achieve very little. Therefore, it is relevant for the clinician to have a good understanding of patient's exercise performance away from the clinic and, ideally, to be able to predict who needs more support.	This is a very helpful comment, thank you. We have added a couple of sentence to the paragraph 'Implications for practice and future research' outlining this point.
Dr Schoo Self-reported exercise performance can be a useful measure of adherence, although in conjunction with other measures. Associated exercise performance outcomes, although not accurate, can provide opportunities for the practitioner to explore underlying issues that impact on patient's program adherence. Mental health (e.g., depression) may be one of the issues patients with chronic and complex physical conditions face and that can impact on their performance (this has not been mentioned as a common issue in people with chronic and complex physical disease).	We fully agree with Dr Schoo's comments about mental health as an important factor affecting adherence, however apart from inserting a brief acknowledgement of this in terms of complex chronic physical conditions, (please see highlight on page three) we consider this to be beyond the scope of the review
Dr Schoo When commenting on the SIRAS as a measure where people are expected to perform, it needs to be realised that observation of exercise does not have to be very obvious. In-clinic supervision can provide some insight in motivation or other factors that may be a barrier to exercise adherence (e.g., fear to do physical damage). Also, there may be a relationship between exercise	We agree with these comments and have included a statement to say how differing assessments f adherence, such as clinician observation, can be useful in combination with a self- report measure; however we reiterate that the focus of this review has been on self- report measures

performance in-clinic and mental health status, although this also needs further study.	
Dr Schoo In my opinion, it will enhance this study when it includes a more robust discussion about self-reported adherence measures and their possible place in enhancing motivation or in assisting to establish an exercise routine (e.g., the latter could be seen as a confounding factor in adherence research since it may remind people to perform their home exercises), particularly in people with chronic and complex chronic disease.	Although we agree with the reviewer that this is an important consideration, this review was not about the role that self-reported adherence measures may play in peoples motivation to exercise; it was about establishing what measures have been developed and used in previous studies, and their measurement properties. At present our research is focused on the need for a psychometrically robust self- report measurement of adherence for use as a research tool; subsequent development may enable this to become a clinical assessment tool and we agree this could be very useful for people with chronic and complex conditions.
Dr Schoo The reference list needs some attention to make it consistent (please see highlighted areas).	The reference list has been extensively examined and to the best of the authors knowledge, all references are now correct and in keeping with the BMJ Open style.
Dr Schoo manuscript comment pg 3 Mental health (i.e., depression) is an important factor to recognise, particularly in the management of chronic and complex disease.	Thank you for this and we completely agree, albeit this being outside the scope of the review. Please see response to your third comment and the highlighted section on page three, (aprox. Line 44)
Dr Schoo manuscript comment pg 3 I think it is difficult to completely separate long-term physical conditions from mental health.	We agree that chronic long term physical conditions can have inseparable consequences on people's mental health. However to explore this was beyond the scope of the review; we were only looking to identify what self-report measures were available for use.
Dr Schoo manuscript comment pg 8 Some studies may have used self-reported adherence as a secondary measure.	Thank you for this comment. Please see our response to your fourth comment and the corresponding additional, highlighted text.
Dr Schoo manuscript comment pg 8 In-clinic measures can be more than observing whether the exercises are completed as instructed As a clinician it is important to have some sort of indication whether the client seems motivated or whether the client may need more support (e.g., education/information, counselling).	Thank you for this interesting point. Please see our response to your second and fourth comment in the overall reviewers' comments.

Dr Schoo manuscript comment pg 8 It is not only compliance versus adherence, but some in-clinic supervision may provided some insight in motivation or other factors that may be a barrier to adherence (e.g., fear to do physical damage). Also, there may be a relationship between performance and mental health status.	Again, thank you for this comment. Please see our response to your fourth comment and the corresponding additional, highlighted text.
Dr Schoo manuscript comment pg 8 True. Therefore, it is important for the practitioner to understand that adherence is associated with motivation, and that motivation can be compromised by factors such as mental health. Indeed, long-term program adherence is required in chronic disease management.	Thank you for this interesting point. We are aware of this interaction but again, we were purely looking for self- report measures that are used in physical rehabilitation.
Dr Schoo manuscript comment pg 9 Is this not a new and different issue? It seems to change the argument. The discussion will be enhanced by retaining a focus on self-reported adherence and, if there is a place for it, how this could be improved.	Please see response to Dr McLeans comment on the same issue (Dr McLean's third comment regarding page eight, line 58)
Dr Schoo manuscript comment pg 9 See previous comment on studies that used multiple measures (and self-report as a possible secondary measure), since each measure measures a different adherence dimension.	Thank you for this. Please see our response to your fourth comment